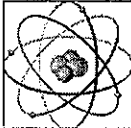



**ATOMS!**  
Unit 5



	Group 1	Group 2
2	Li	Be
3	Na	Mg



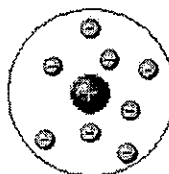
### I. MODELS

- a. MODEL: a representation that shows the construction or appearance of something.
- b. As our technology has evolved our \_\_\_\_\_ and models have also evolved.
- c. Models of the \_\_\_\_\_ have changed through the years as we have discovered new things.

### II. Rutherford's Model

- a. In 1911, Ernest Rutherford tested another scientist's model (J.J. Thomson).
- b. Rutherford discovered that an atom is mostly made up of \_\_\_\_\_.
- c. He said that the center of the atom is a small, dense nucleus that is \_\_\_\_\_ charged.

- d. Rutherford said the negatively charged particles were \_\_\_\_\_ to the positively charged particles found in the \_\_\_\_\_.

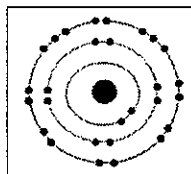
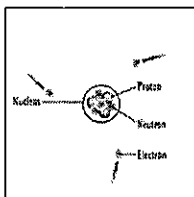


- e. He said this attraction \_\_\_\_\_ the negatively charged particles in the atom.
- f. He didn't really address electrons.

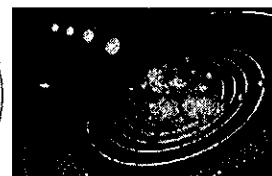
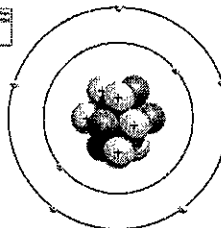
### III. Bohr's Model

- a. According to Bohr's Model, there are 2 main pieces of an atom:

1. \_\_\_\_\_
2. \_\_\_\_\_



### The Bohr Model



### IV. What is True Today

- The nucleus is composed of 2 things:
  - \_\_\_\_\_ (positively charged particles)
  - **NEUTRONS** ( \_\_\_\_\_ charged particles)
- Electrons are in a \_\_\_\_\_ - they are in orbitals, or regions of probable electron location.
- They \_\_\_\_\_ **move around the nucleus** in different patterns.

### V. Wave-Mechanical Model

Electrons are moving so fast that they look like a cloud. **Orbitals** are regions of most likely electron location.

### VI. Components of an Atom

- Atoms are the building blocks of \_\_\_\_\_
- Atoms are made up of **subatomic particles**
  - **Sub** means \_\_\_\_\_ or less than
  - **Atomic** means \_\_\_\_\_
  - So subatomic particles are the smaller particles that make up an \_\_\_\_\_.
  - The 3 subatomic particles are:
    - **protons**
    - \_\_\_\_\_
    - **neutrons**

### VII. Meet the ATOM!

Subatomic Particle	Location in the Atom	Charge	Weight
Protons	Center (in the nucleus)	+ (Positive)	1 amu*
Neutrons	Center (in the nucleus)	Neutral (no charge)	1 amu
Electrons	Around the nucleus in clouds or orbitals	- (Negative)	Almost none! It rounds to 0 amu

\*Amu means **A**tom**M**ass **U**nit

### VIII. AMU

- AMU= **A**tom**M**ass **U**nit
- This is the unit of measure scientist use to measure the \_\_\_\_\_.
- 1 amu = mass of 1 proton or 1 neutron.
- The mass of an electron = 1/1836 amu.

#### PROTONS

- **POSITIVE** charges
- Found in the **CENTER** of the atom - aka **nucleus**
- **"HEAVY!"** (1amu)

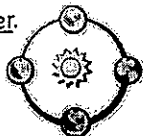
#### ELECTRONS

- **NEGATIVE** charges
- **FLY** around the nucleus in **"orbitals"** or **energy levels!**
- **LIGHT!** So light in fact, that they don't factor in to the mass of an atom!

IX. Back to the Atom...Why it Works

a. \_\_\_\_\_ hold the atom together.

b. Opposite charges attract and like repel!



c. The \_\_\_\_\_ charged electrons are moving so fast that they stay in orbit around the positively charged \_\_\_\_\_.

X. Remember Elements?

- An element, remember, is a substance that cannot be \_\_\_\_\_ broken down into simpler things!
- Elements are made up of \_\_\_\_\_!
- There are many of different elements - Elements are like classification of animals....
- There are about \_\_\_\_\_ known today.
- They're organized and arranged on the \_\_\_\_\_!

XI. Ions

a. If an atom gains or loses electrons it is called an \_\_\_\_\_.

b. Gaining or losing an electron gives the atom a charge.

– The charge could be positive (if the atom \_\_\_\_\_ electrons) or negative (if it gains electrons).

c. An atom is still the same element if it gains or loses electrons, it just now has a \_\_\_\_\_.

d. We call an atom with a charge an \_\_\_\_\_.

XII. Isotopes

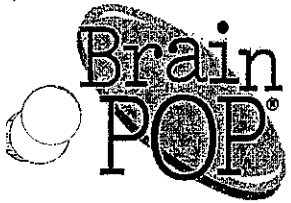
a. An isotope is when an atom is missing or has extra \_\_\_\_\_.

b. Just like an ion, an \_\_\_\_\_ is still the same element it is just a little different from every other atom of the same element.

c. For example-A \_\_\_\_\_ can have 12 neutrons or 14 neutrons. It is still carbon, it just has a slightly different mass.

– Think of a pillow- some have more stuffing than others so their mass may be different but they are still all pillows.





# ATOMIC MODEL

Date: \_\_\_\_\_

Name: \_\_\_\_\_

Class: \_\_\_\_\_

1 How do scientists know how atoms are structured?

- A By looking at them under a microscope
- B By running experiments that expose their properties
- C By examining only the largest atoms
- D By splitting them apart

2 What can you conclude from the fact that scientists continue to update the atomic model?

- A New information about atoms continues to be discovered
- B Old information about atoms is completely useless
- C Scientists did not have any information about atoms until a few years ago
- D Scientists still have no idea what atoms look like

3  What contribution did John Dalton make to atomic theory?

- A He discovered that every atom was positively charged
- B He discovered that every element consisted of one type of atom
- C He discovered that atoms had nuclei
- D He discovered that atoms could be divided into smaller parts

4 Place the following scientists in order, from earliest to latest: A) Ernest Rutherford; B) J.J. Thomson; C) John Dalton

- A B, C, A
- B C, A, B
- C A, C, B
- D C, B, A

5 The majority of an atom's mass exists where?

- A In the nucleus
- B In the electron cloud
- C In the space between the nucleus and the electrons
- D In the neutrons

6 What are electrons?

- A Positively charged particles
- B Neutrally charged particles
- C Negatively charged particles
- D Uncharged particles

7 Ernest Rutherford discovered that atoms were mostly:

- A Negatively charged
- B Positively charged
- C Electrons
- D Empty space

8  What does the nucleus of an atom contain?

- A Electrons and neutrons
- B Protons and neutrons
- C Neutrinos and positrons
- D DNA and RNA

9 How are neutrons different from protons and electrons?

- A They are more massive than protons and electrons
- B They have no electrical charge
- C They are less massive than protons and electrons
- D Protons and electrons exist in atomic nuclei; neutrons orbit the nucleus in a "cloud"

10 How are electrons arranged in an atom?

- A In groups of five
- B In energy levels
- C By color
- D By shape